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22. Leipzig – Probstheidaer Notfalltag

05.03.2016

ERC Leitlinien 2015

Dr. Alexander Dünnebier
Klinik und Poliklinik für Anästhesiologie und Intensivtherapie
Universitätsklinikum Leipzig AöR

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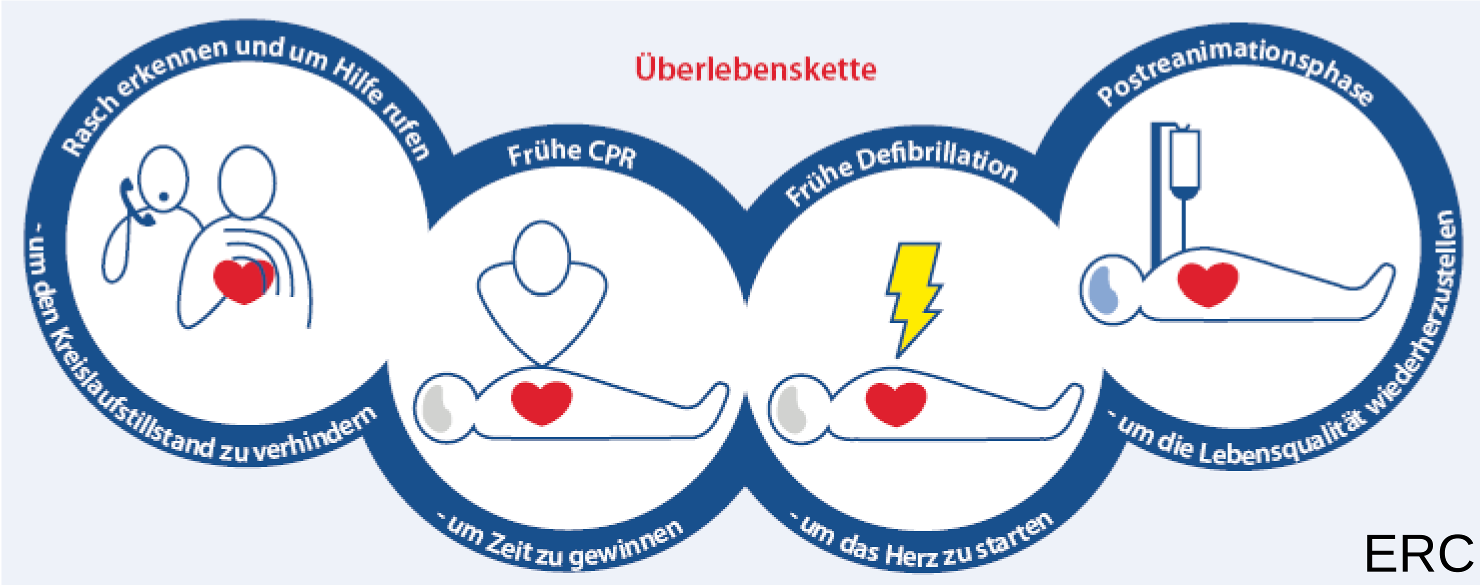
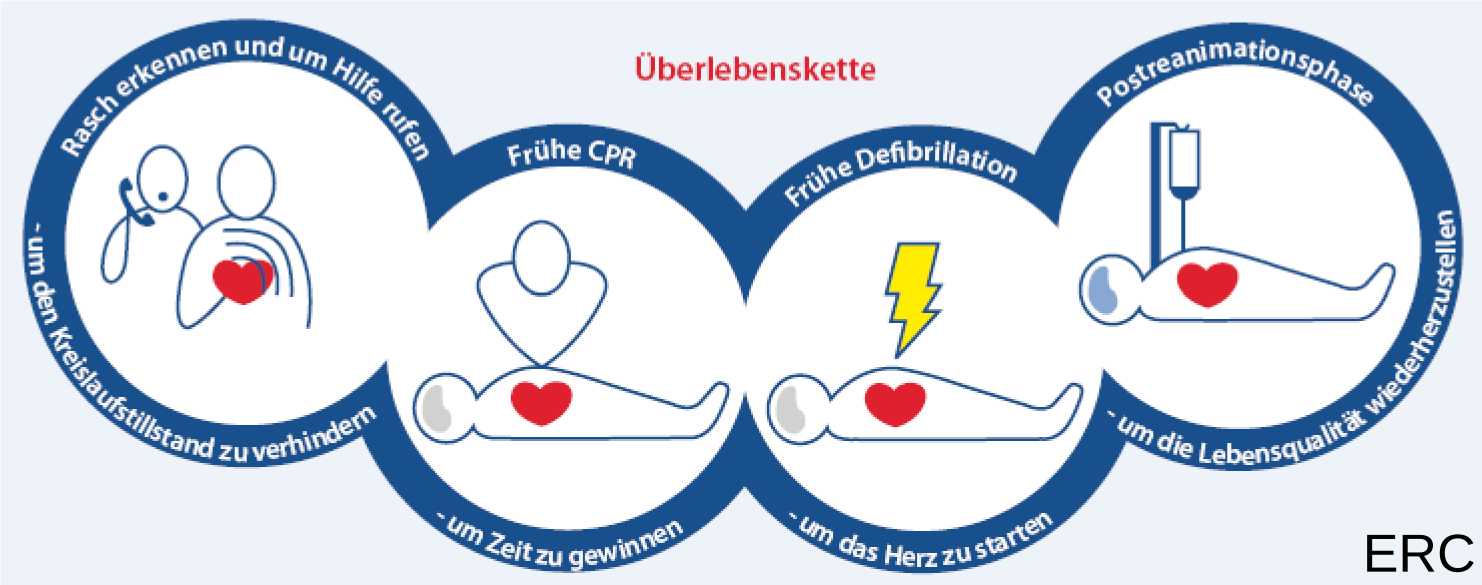
- 350.000 erfolglose Reanimationen in Europa / Jahr aufgrund OHCA
- d. h. alle 90 s verstirbt ein Mensch an den Folgen des plötzlichen Herztodes
- in D ~ 75.000 außerklinische Reanimationen / Jahr
  [Deutsches Reanimationsregister]
- deutliche Schwankungen bei den Überlebensraten
  (regional unter 10 bis zu 60 %)
  - in D bei optimalen Verlauf **15 – 20 %** [Deutsches Reanimationsregister]
  - überwiegend **akzeptable Lebensqualität** der Überlebenden



- Fokus auf ***Ersthelfer*** und ***Laien***
- normale Atmung? Cave: ***Schnappatmung / Krampfanfall***
- Rolle des ***Leitstellendisponenten*** hervorgehoben
- ***qualitativ hochwertige*** Wiederbelebungsmaßnahmen
- zeitnahe Verfügbarkeit eines ***AED***, Förderung von PAD Programmen
- flächendeckende ***Ausbildung von Laien***, Einführung der Ausbildung von ***Schülern*** ab dem 12. Lebensjahr



Ziel: „Herzdruckmassage durch jeden!"

Empfehlungen zu Maßnahmen des BLS unverändert:

in jedem Fall Thoraxkompressionen, bei entsprechender Ausbildung mit Beatmung 30 : 2

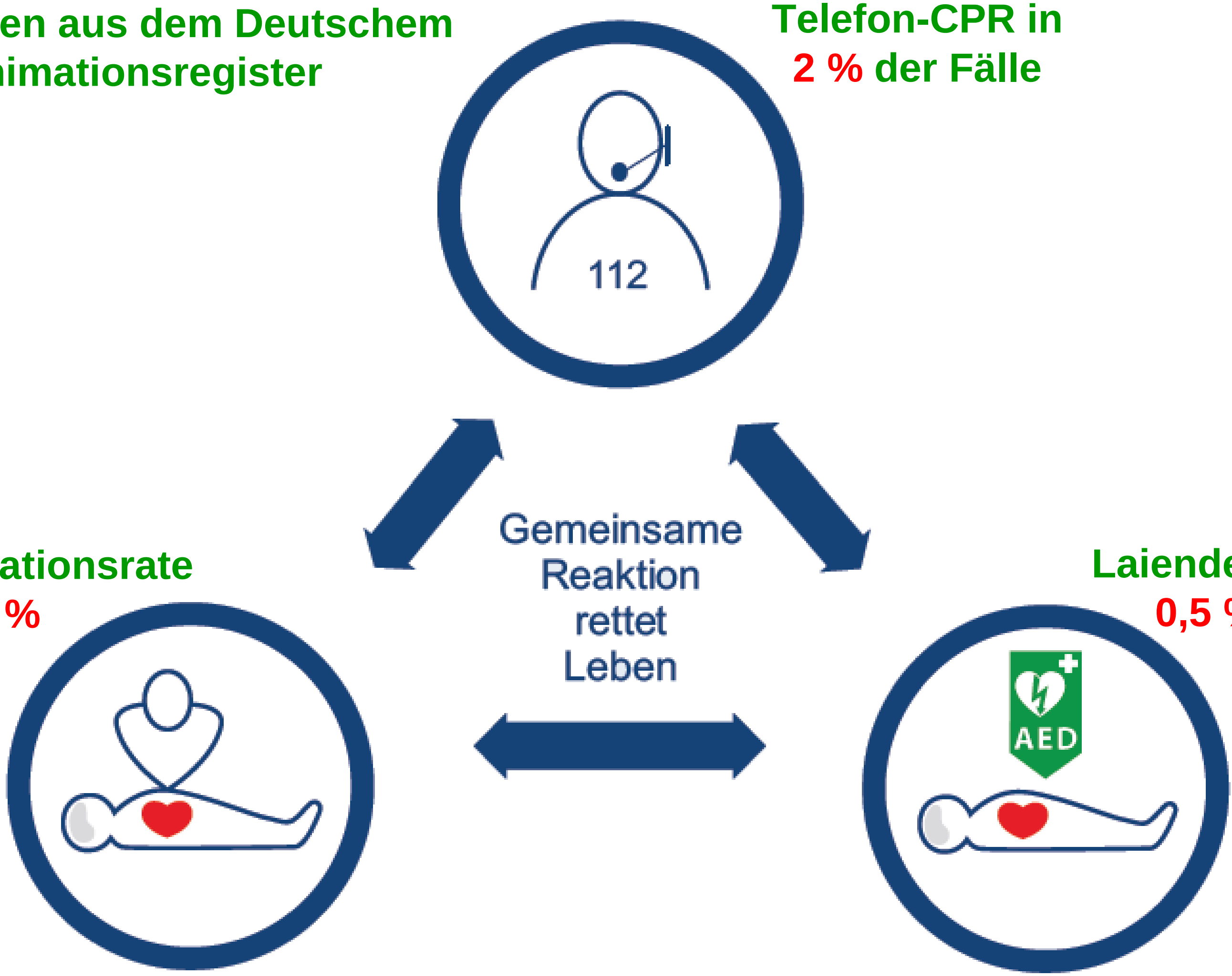
BLS

aktuell Zahlen aus dem Deutschem Reanimationsregister

Telefon-CPR in 2 % der Fälle

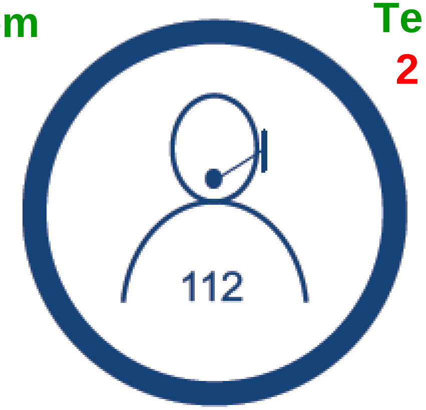
Laienreanimationsrate < 20 %

Laiendefibrillation in 0,5 % der Fälle



ERC 2015

aktuell Zahlen aus dem Deutschem Reanimationsregister



Telefon-CPR in 2 % der Fälle

Informationen für die Notärzte im Rettungsdienst der Stadt Leipzig zum Betriebsstart der Integrierten Regionalleitstelle (IRLS) am 27.01.2016

3.1 Notrufannahme

Der Prozess der Notrufannahme wurde durch die Integration aktueller notfallmedizinischer Empfehlungen optimiert. Insbesondere soll die Erkennung des Herz-Kreislauf-Stillstandes durch den Disponenten und damit die Anleitung der Telefonreanimation zuverlässiger erfolgen können.

3.4 Telefonreanimation

Der standardisierte Ablauf der Telefonreanimation wurde inhaltlich und grafisch optimiert, und stärker in den Prozess der Notrufannahme integriert. Aktuelle Empfehlungen zur Anleitung der Reanimation durch die Leitstellendisponenten wurden berücksichtigt.

ERC 2015

BLS

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Early Cardiopulmonary Resuscitation in Out-of

Ingela Hasselqvist-Ax, R
Mårten Rosenqvist
Per Nordberg, M.D., Ph.D
Christer Axelsson, R.N., P
an

BACKGROUND
Three million people in S (CPR). Whether this traini survival rate among perso questioned.

METHODS
We analyzed a total of 30,3 from January 1, 1990, throu performed before the arriv early CPR was correlated w

RESULTS
CPR was performed before performed before the arriv rate was 10.5% when CPR CPR was not performed bef for a propensity score (whi diac arrest, cause of cardi time from collapse to call EMS was associated with a confidence interval, 1.88 to were found to be in ventric the results were similar. Th rate remained stable over t observed between the time vival rate.

CONCLUSIONS
CPR performed before EMS arrival was associated with a 30-day survival rate after an out-of-hospital cardiac arrest that was more than twice as high as that associated with no CPR before EMS arrival. (Funded by the Laerdal Foundation for Acute Medicine and others.)

Subgroup	Survival Rate — No CPR before EMS Arrival	Survival Rate — CPR before EMS Arrival	Patients with No CPR before EMS Arrival	Patients with CPR before EMS Arrival
	%		no.	
All patients	4.0	10.5	14,869	15,512
Age				
≤72 yr	5.6	12.7	6,405	9,043
>72 yr	2.9	7.9	8,011	5,929
Sex				
Female	4.1	8.3	4,343	4,053
Male	4.1	11.5	10,036	11,085
Cause of cardiac arrest				
Cardiac	4.2	11.5	10,205	10,452
Noncardiac	3.4	8.5	3,694	3,993
Location of cardiac arrest				
At home	3.1	5.9	10,783	8,544
Other location	6.7	16.3	3,949	6,855
Initial ECG rhythm				
VF or VT	9.4	20.1	4,194	5,900
Asystole or PEA	1.5	3.2	9,487	8,394
Year of cardiac arrest				
1990–1995	3.8	9.7	3,892	2,629
1996–2001	3.0	6.9	4,697	3,563
2002–2007	4.6	10.7	3,562	3,923
2008–2011	5.5	13.4	2,562	5,278

0.5

Figure 2. Subgroup Analysis of Survival Rates.
ECG denotes electrocardiographic, PEA pulseless electrical activity, VF ventricular f

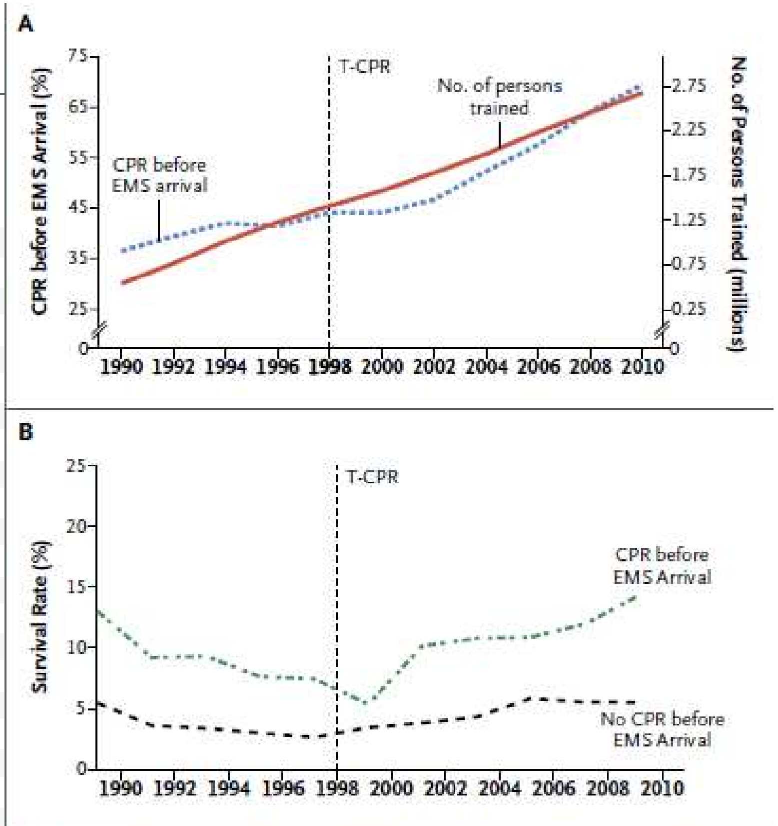


Figure 1. Changes over Time in CPR Training, the Performance of Early CPR, and Survival Rates.
Panel A shows the number of persons in Sweden who were trained in cardiopulmonary resuscitation (CPR) and the proportion of patients in whom CPR was started before the arrival of emergency medical services (EMS). Panel B shows the survival rate when CPR was given and when CPR was not given before EMS arrival. In both panels, the vertical line (T-CPR) indicates the year in which telephone-assisted CPR was introduced in Sweden.

ALS-Algorithmus

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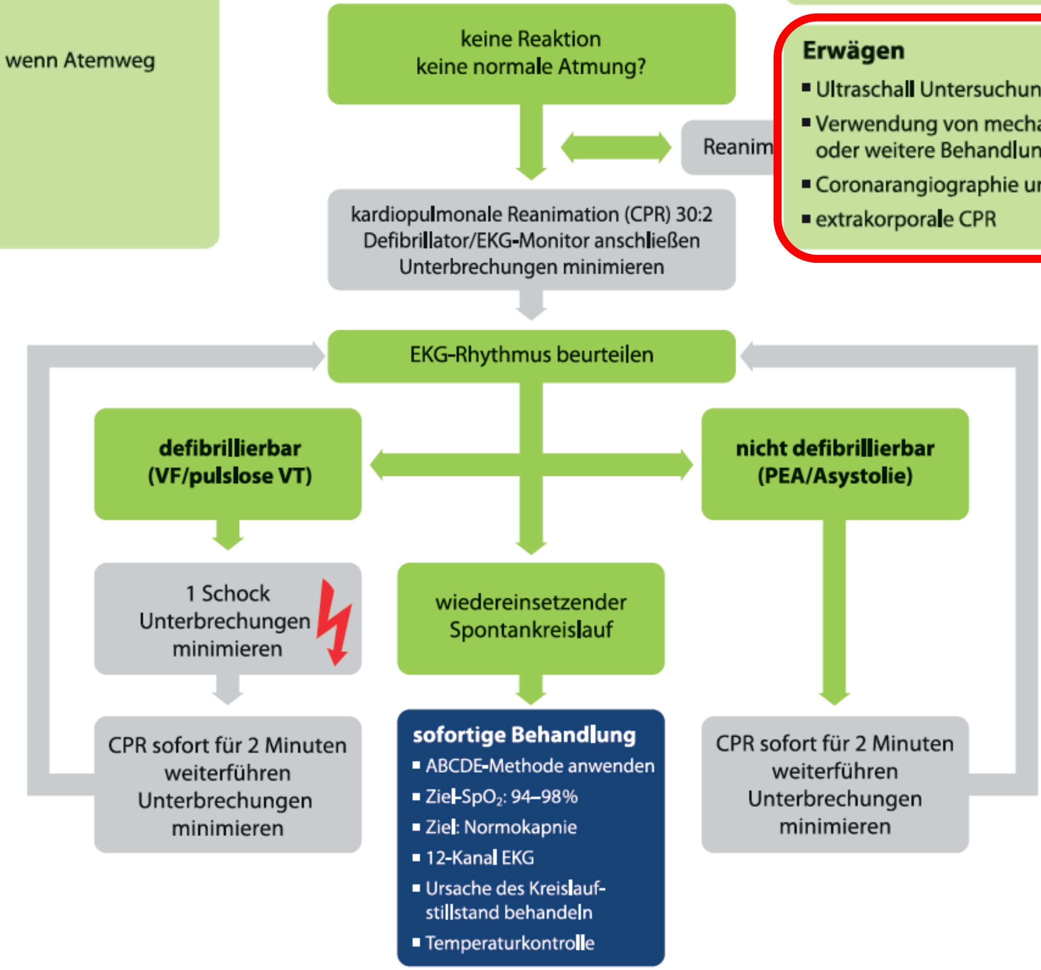
während CPR
- CPR hoher Qualität sichern: Frequenz, Tiefe, Entlastung
- Unterbrechungen der Thoraxkompression minimieren
- Sauerstoff geben
- Kapnographie verwenden
- Thoraxkompression ohne Unterbrechung wenn Atemweg gesichert
- Gefäßzugang (intravenös oder intraossär)
- Adrenalin alle 3–5 Minuten
- Amiodaron nach dem 3. Schock

Advanced Life Support



reversible Ursachen behandeln

Hypoxie	Herzbeuteltamponade
Hypovolämie	Intoxikation
Hypo-/Hyperkaliämie/metabolisch	Thrombose (kardial oder pulmonal)
Hypo-/Hyperthermie	Spannungspneumothorax

Erwägen
- Ultraschall Untersuchung
- Verwendung von mechanischen Reanimationsgeräten für Transport oder weitere Behandlung
- Coronarangiographie und Perkutane Coronar Intervention (PCI)
- extrakorporale CPR

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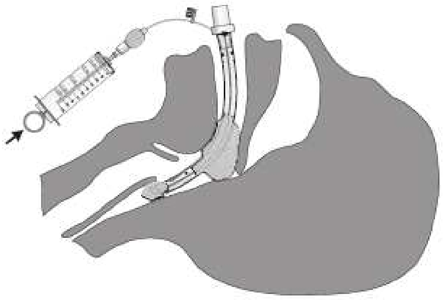
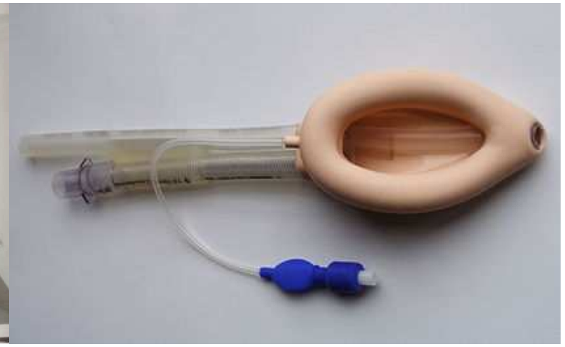
ALS – Atemwegsmanagement



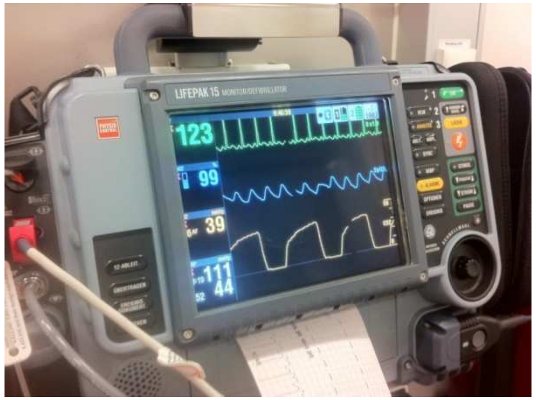



- optimale Strategie **?**
- ETI Goldstandard
- kein Vorteil für invasive Atemwegssicherung
- differenzierte und stufenweise Herangehensweise
  (***Umstände***, ***Phase*** der Reanimation und ***Fertigkeiten)***
- Unterbrechung der CPR sollen ***5 s*** nicht überschreiten

ALS – Beatmung

- maximal verfügbare O_2-Konzentration
- Parameter unverändert:
  - AZV ***500 – 600 ml*** (normale Atembewegung)
  - Inspirationszeit ***1 s***
  - 30 : ***2*** bei ungesichertem AW
  - AF ***10 / min*** nach Atemwegssicherung
- starke Empfehlung zur Anwendung der ***Kapnographie***

ALS – Beatmung – Kapnographie



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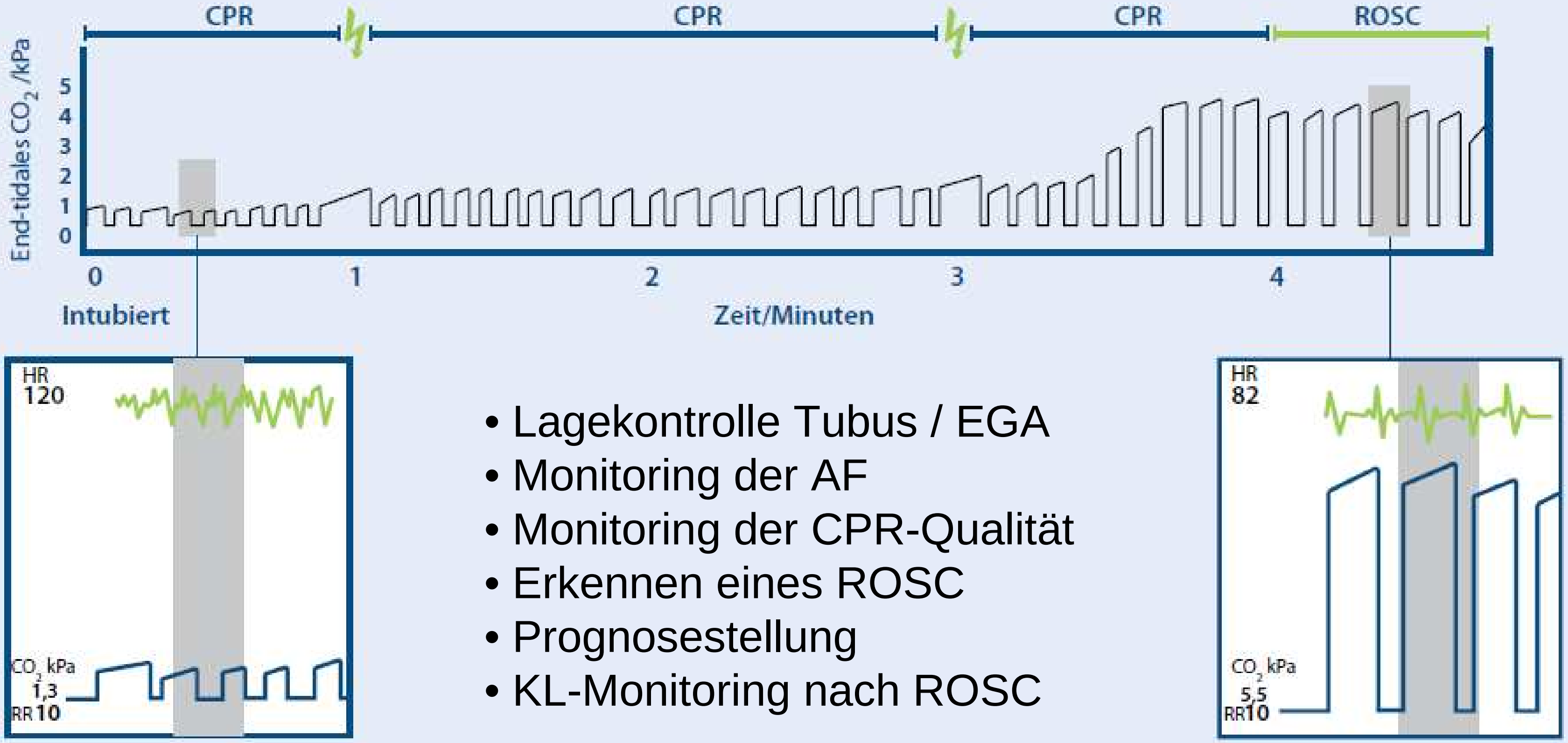

- Lagekontrolle Tubus / EGA
- Monitoring der AF
- Monitoring der CPR-Qualität
- Erkennen eines ROSC
- Prognosestellung
- KL-Monitoring nach ROSC

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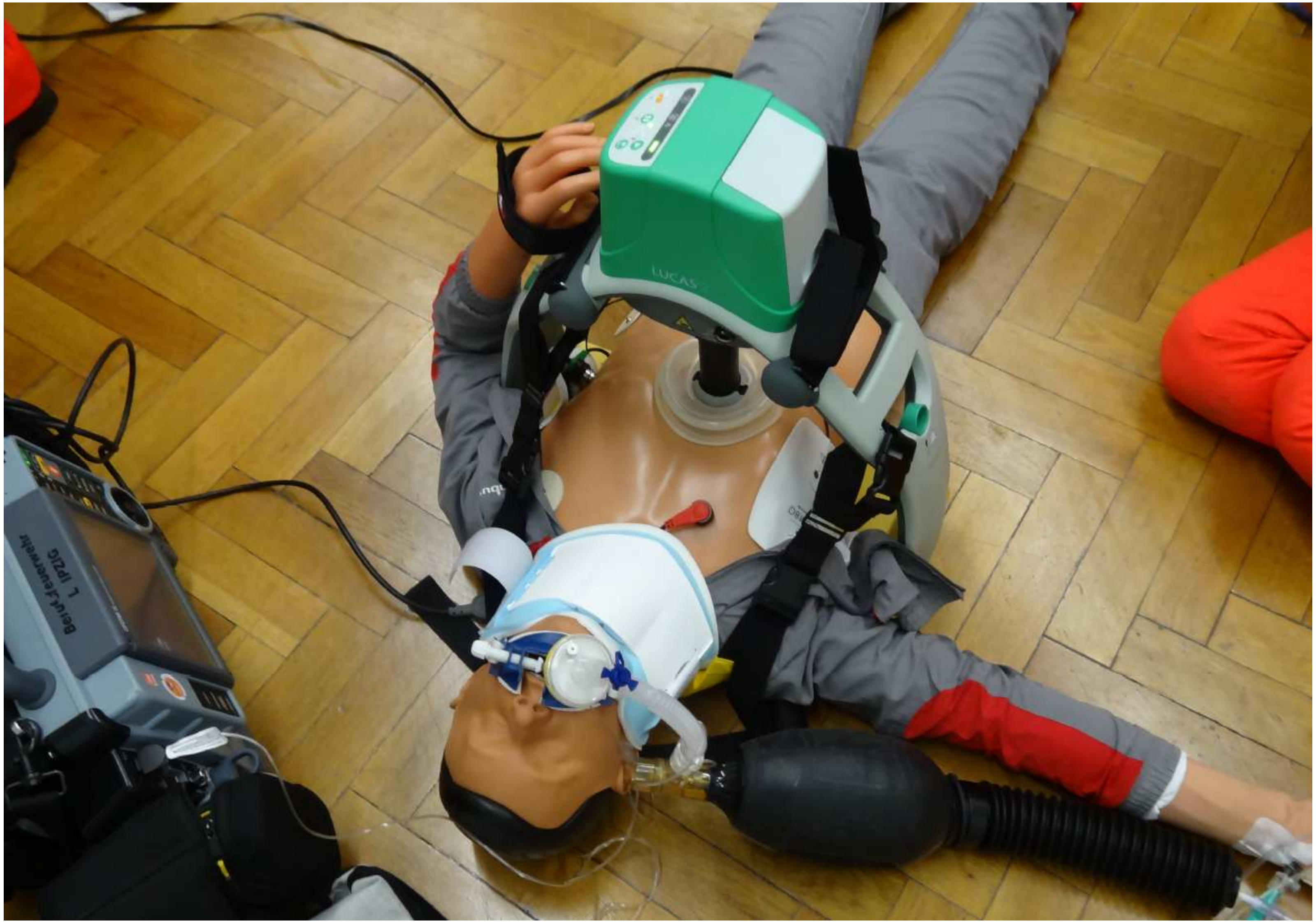
ALS – Circulation

- Kompressionstiefe unverändert ***5 – 6 cm***
- Kompressionsfrequenz unverändert ***100 – 120 / min***
- Unterbrechungen der Thoraxkompressionen minimieren
- nach AW-Sicherung kontinuerliche HDM

- „compression-only CPR“:
  - Tierversuche: erste Minuten nach nicht asphyktischem Kreislaufstillstand, Beobachtungsstudien
  - keine Änderungen des aktuellen Vorgehens
  - trainierte Helfer, die in der Lage sind, sollen weiterhin ***auch beatmen***

ALS – Circulation, Mechanische Geräte zur Thoraxkompression



ALS – Circulation, Mechanische Geräte zur Thoraxkompression

Original Investigation

Mechanical Chest Compressions and Simultaneous Defibrillation vs Conventional Cardiopulmonary Resuscitation in Out-of-Hospital Cardiac Arrest
The LINC Randomized Trial

Sten Rubertsson, MD, PhD; Erik Lindgren, MD; David Smekal, MD, PhD; Ollie Östlund, PhD; Johan Silfverstolpe, MD; Robert A. Lichtveld, MD, PhD; Rene Boomars, MPA; Björn Ahlstedt, MD; Gunnar Skoog, MD; Robert Kastberg, MD; David Halliwell, RN; Martyn Box, RN; Johan Herlitz, MD, PhD; Rolf Karlsten, MD, PhD

IMPORTANCE A strategy using mechanical chest compressions might improve the poor outcome in out-of-hospital cardiac arrest, but such a strategy has not been tested in large clinical trials.

OBJECTIVE To determine whether administering mechanical chest compressions with defibrillation during ongoing compressions (mechanical CPR), compared with manual cardiopulmonary resuscitation (manual CPR), according to guidelines, would improve 4-hour survival.

DESIGN, SETTING, AND PARTICIPANTS Multicenter randomized clinical trial of 2589 patients with out-of-hospital cardiac arrest conducted between January 2008 and February 2013 in 4 Swedish, 1 British, and 1 Dutch ambulance services and their referring hospitals. Duration of follow-up was 6 months.

INTERVENTIONS Patients were randomized to receive either mechanical chest compressions (LUCAS Chest Compression System, Physio-Control/Jolife AB) combined with defibrillation during ongoing compressions ($n = 1300$) or to manual CPR according to guidelines ($n = 1289$).

MAIN OUTCOMES AND MEASURES Four-hour survival, with secondary end points of survival up to 6 months with good neurological outcome using the Cerebral Performance Category (CPC) score. A CPC score of 1 or 2 was classified as a good outcome.

RESULTS Four-hour survival was achieved in 307 patients (23.6%) with mechanical CPR and 305 (23.7%) with manual CPR (risk difference, −0.05%; 95% CI, −3.3% to 3.2%; $P > .99$). Survival with a CPC score of 1 or 2 occurred in 98 (7.5%) vs 82 (6.4%) (risk difference, 1.18%; 95% CI, −0.78% to 3.1%) at intensive care unit discharge, in 108 (8.3%) vs 100 (7.8%) (risk difference, 0.55%; 95% CI, −1.5% to 2.6%) at hospital discharge, in 105 (8.1%) vs 94 (7.3%) (risk difference, 0.78%; 95% CI, −1.3% to 2.8%) at 1 month, and in 110 (8.5%) vs 98 (7.6%) (risk difference, 0.86%; 95% CI, −1.2% to 3.0%) at 6 months with mechanical CPR and manual CPR, respectively. Among patients surviving at 6 months, 99% in the mechanical CPR group and 94% in the manual CPR group had CPC scores of 1 or 2.

CONCLUSIONS AND RELEVANCE Among adults with out-of-hospital cardiac arrest, there was no significant difference in 4-hour survival between patients treated with the mechanical CPR algorithm or those treated with guideline-adherent manual CPR. The vast majority of survivors in both groups had good neurological outcomes by 6 months. In clinical practice, mechanical CPR using the presented algorithm did not result in improved effectiveness compared with manual CPR.

TRIAL REGISTRATION clinicaltrials.gov Identifier: NCT00609778

JAMA. 2014;311(1):53-61. doi:10.1001/jama.2013.282538
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Author Affiliations: Author affiliations are listed at the end of this article.

Corresponding Author: Sten Rubertsson, MD, PhD, Department of Surgical Sciences/Anaesthesiology and Intensive Care, Uppsala University, Uppsala University Hospital, SE 75185 Uppsala, Sweden (sten.rubertsson@akademiska.se).

Mechanical versus manual chest compression for out-of-hospital cardiac arrest (PARAMEDIC): a pragmatic, cluster randomised controlled trial

*Gavin D Perkins, Ranjit Lall, Tom Quinn, Charles D Deakin, Matthew W Cooke, Jessica Horton, Sarah E Lamb, Anne-Marie Slowther, Malcolm Woollard, Andy Carson, Mike Smyth, Richard Whitfield, Amanda Williams, Helen Pocock, John J M Black, John Wright, Kyee Han, Simon Gates, PARAMEDIC trial collaborators**

Summary

Background Mechanical chest compression devices have the potential to help maintain high-quality cardiopulmonary resuscitation (CPR), but despite their increasing use, little evidence exists for their effectiveness. We aimed to study whether the introduction of LUCAS-2 mechanical CPR into front-line emergency response vehicles would improve survival from out-of-hospital cardiac arrest.

Methods The pre-hospital randomised assessment of a mechanical compression device in cardiac arrest (PARAMEDIC) trial was a pragmatic, cluster-randomised open-label trial including adults with non-traumatic, out-of-hospital cardiac arrest from four UK Ambulance Services (West Midlands, North East England, Wales, South Central). 91 urban and semi-urban ambulance stations were selected for participation. Clusters were ambulance service vehicles, which were randomly assigned (1:2) to LUCAS-2 or manual CPR. Patients received LUCAS-2 mechanical chest compression or manual chest compressions according to the first trial vehicle to arrive on scene. The primary outcome was survival at 30 days following cardiac arrest and was analysed by intention to treat. Ambulance dispatch staff and those collecting the primary outcome were masked to treatment allocation. Masking of the ambulance staff who delivered the interventions and reported initial response to treatment was not possible. The study is registered with Current Controlled Trials, number ISRCTN08233942.

Findings We enrolled 4471 eligible patients (1652 assigned to the LUCAS-2 group, 2819 assigned to the control group) between April 15, 2010 and June 10, 2013. 985 (60%) patients in the LUCAS-2 group received mechanical chest compression, and 11 (<1%) patients in the control group received LUCAS-2. In the intention-to-treat analysis, 30 day survival was similar in the LUCAS-2 group (104 [6%] of 1652 patients) and in the manual CPR group (193 [7%] of 2819 patients; adjusted odds ratio [OR] 0·86, 95% CI 0·64–1·15). No serious adverse events were noted. Seven clinical adverse events were reported in the LUCAS-2 group (three patients with chest bruising, two with chest lacerations, and two with blood in mouth). 15 device incidents occurred during operational use. No adverse or serious adverse events were reported in the manual group.

Interpretation We noted no evidence of improvement in 30 day survival with LUCAS-2 compared with manual compressions. On the basis of ours and other recent randomised trials, widespread adoption of mechanical CPR devices for routine use does not improve survival.

Funding National Institute for Health Research HTA – 07/37/69.

Lancet 2015; 385: 947–55
Published Online November 16, 2014
http://dx.doi.org/10.1016/S0140-6736(14)61886-9

See Comment page 920

*Collaborators listed at end of paper

Warwick Clinical Trials Unit, University of Warwick, Coventry, UK (Prof G D Perkins MD, R Lall PhD, Prof M W Cooke PhD, J Horton MSc, Prof S E Lamb DPhil, A-M Slowther DPhil, M Smyth MSc, Prof S Gates PhD); **Heart of England NHS Foundation Trust, Birmingham, UK,** (Prof G D Perkins); **Surrey Peri-operative Anaesthesia Critical care collaborative Research Group, Faculty of Health and Medical Sciences, University of Surrey, Guildford, UK** (Prof T Quinn M Phil, Prof M Woollard MPH, Prof C D Deakin MD); **South Central Ambulance Service NHS Foundation Trust, Otterbourne, UK** (Prof C D Deakin, H Pocock MSc, J J M Black FCEM); **NIHR Southampton Respiratory Biomedical Research Unit, University Hospital Southampton NHS Foundation Trust, Southampton Hampshire** (Prof C D Deakin); **University of Oxford, Oxford, UK** (Prof S E Lamb); **West Midlands Ambulance Service NHS Foundation Trust, Brierley Hill, UK** (A Carson FRCGP, M Smyth); **Welsh Ambulance Services NHS Trust, Denbighshire, Wales, UK** (R Whitfield BSc, A Williams MA); **North East Ambulance Service NHS Foundation Trust, Newcastle upon Tyne, UK** (J Wright FCEM, K Han FCEM); **and Royal Victoria Infirmary, Newcastle upon Tyne, UK** (J Wright)

Introduction

The burden of cardiac arrest out of hospital is substantial, with an estimated 424 000 cardiac arrests occurring each year of about in the USA[1] and 275 000 in Europe.[2] As few as one in 12 victims of cardiac arrest out of hospital survive to return home.[2,3] High-quality chest compressions of sufficient depth[4] and rate,[5] with full recoil of the chest between compressions[5] and avoidance of interruptions[6] are crucial to survival. Maintenance of high-quality compressions during out-of-hospital resuscitation is difficult because of the small number of crew present, fatigue, patient access, competing tasks (eg, defibrillation, vascular access) and difficulty of performing resuscitation in a moving vehicle.[7]

Mechanical compression devices suitable for use in the pre-hospital environment have been developed to automate and potentially improve this process. At the time of initiating this study, one large randomised trial of a load distributing band mechanical device had been done and was terminated early because of the worsened long-term outcomes in patients allocated to mechanical compression.[8] The subsequent Cochrane review reported insufficient evidence to conclude that mechanical chest compressions are associated with benefit or harm and their widespread use is not supported.[9] Since then, two further large randomised efficacy trials have been reported. The CIRC trial[10] assessed the load distributing band and reported it was equivalent to manual cardiopulmonary resuscitation

ALS – Circulation, Mechanische Geräte zur Thoraxkompression

- keine routinemäßige Anwendung
- ***realistische Überlebenschance*** und ***reversible Ursache***
- sinnvolle Alternative, wenn manuelle Kompressionen nicht möglich oder praktikabel:
  - *Reanimation auf dem Transport*
  - *lang andauernde CPR*
  - *während Koronarangiographie*
  - *überbrückend während Vorbereitung eines extrakorporalen Verfahrens (ECLS)*

Mechanische Geräte zur Thoraxkompression und Beatmung

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EJA

Eur J Anaesthesiol 2016; **33**:1 – 4

EDITORIAL

Don't forget to ventilate during cardiopulmonary resuscitation with mechanical chest compression devices

Michael Bernhard, Björn Hossfeld, Bernhard Kumle, Torben K. Becker, Bernd Böttiger and Torsten Birkholz

- Effektive Beatmungen mit SGA während kontinuierlicher mechanischer Thoraxkompressionen nicht gegeben?!
- Bedeutung der Oxygenierung und Decarboxylierung hervorgehoben
- Fazit für die Praxis:
- auf Leckagen und inadäquate Ventilation achten (Kapnographie!!!)
- bei Hinweis auf ineffektive Beatmung auf 30 : 2 wechseln
- ggf. Intubation

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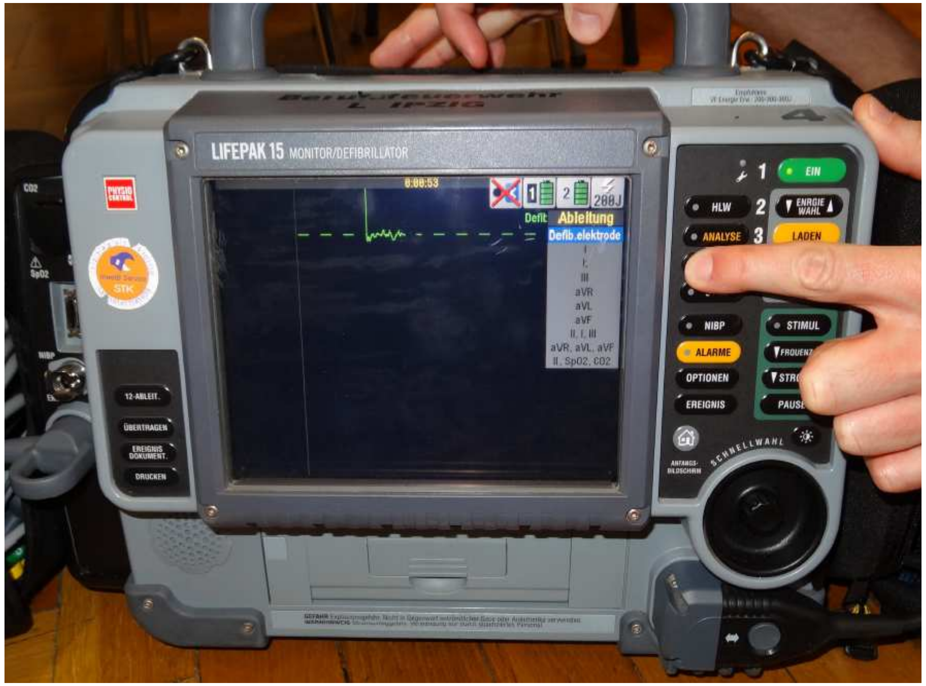
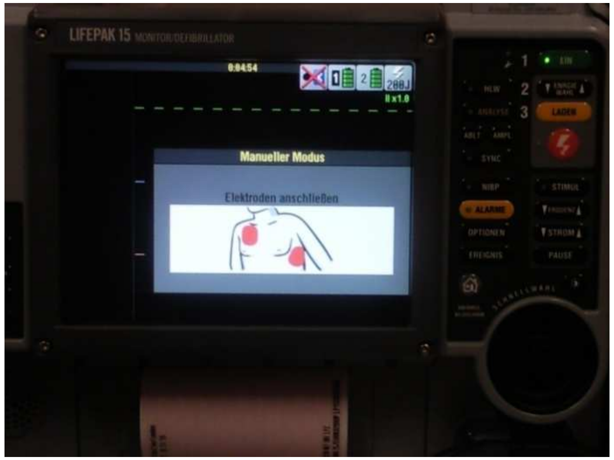
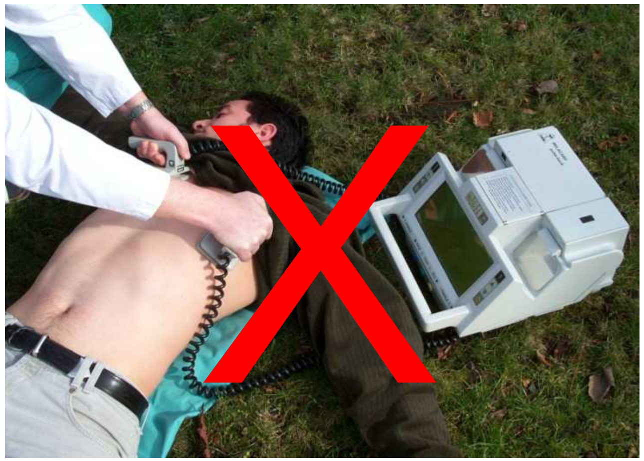
- ***manuelle Defibrillatoren*** den AEDs vorziehen
- optimale Energiestufen **?**, ***mindestens 150 J*** für ersten Schock (**Herstellerempfehlungen beachten**)
- eskalierende Energiestufen bei anhaltendem VF sinnvoll



ALS – Defibrillation

- Einsatz von selbst klebenden Defi-Pads
- Verkürzung der Prä- und Postschockpause (optimal **< 5 s**)





ALS – Defibrillation

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Resuscitation 89 (2015) 162–168

Contents lists available at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

ELSEVIER

Clinical paper

The need to resume chest compressions immediately after defibrillation attempts: An analysis of post-shock rhythms and duration of pulselessness following out-of-hospital cardiac arrest☆

Ava E. Pierce*, Lynn P. Roppolo, Pamela C. Owens, Paul E. Pepe, Ahamed H. Idris

The Department of Emergency Medicine, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd, Dallas, TX 75390, USA

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Ventricular fibrillation
Defibrillation
Return of spontaneous circulation

ABSTRACT

Aim: Current consensus guidelines for cardiopulmonary resuscitation (CPR) recommend that chest compressions resume immediately after defibrillation attempts and that rhythm and pulse checks be deferred until completion of 5 compression:ventilation cycles or minimally for 2 min. However, data specifically confirming the post-shock duration of asystole or pulseless electrical activity before return of spontaneous circulation (ROSC) are lacking. Our aim was to describe the frequency of the various post-shock cardiac rhythms and the duration of post-shock pulselessness in out-of-hospital non-traumatic cardiac arrest.

Method: Using prospectively-collected data from the Resuscitation Outcomes Consortium (ROC) Epistry database, the investigators reviewed monitor-defibrillator recordings of 176 patients who received defibrillation attempts in the out-of-hospital setting for ventricular fibrillation (VF) or ventricular tachycardia (VT) with absent pulses,.

Results: Among 376 different defibrillation attempts delivered in the 176 patients, there were 182 resulting episodes of post-shock asystole. The mean interval of asystole after defibrillation was 69 ± 136 s (median 20 s; IQR 36) and the mean interval for return of an organized rhythm was 64 ± 157 s (median 7 s; IQR 26). The mean time to ROSC was 280 ± 320 s (median 136 s; IQR 445).

Conclusion: After defibrillation attempts, the majority of patients remain pulseless for over 2 min and the duration of asystole before return of pulses is longer than 120 s beyond the shock gap in as many as 25%. These data support the recommendation to immediately resume chest compressions for 2 min following attempted defibrillation.

ALS – Defibrillation

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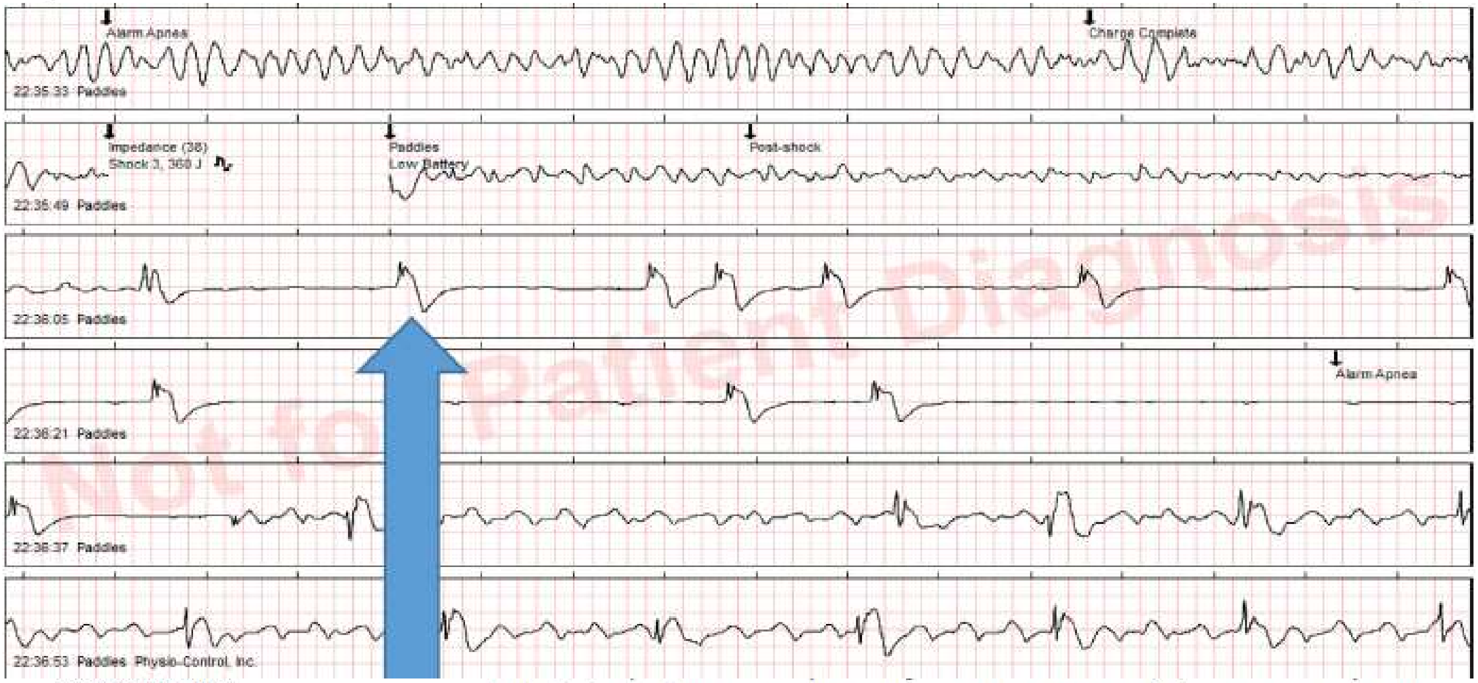

Defibrillation
Return of spontaneous circulation

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ALS – Defibrillation

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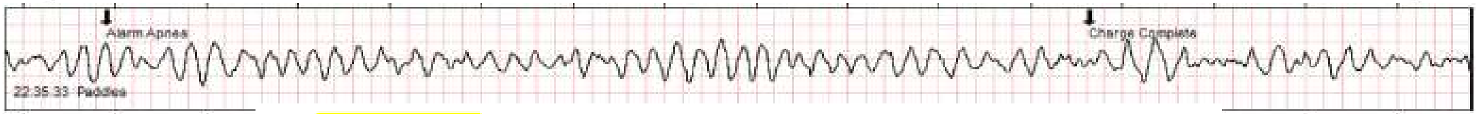
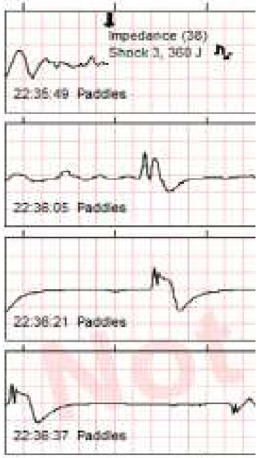
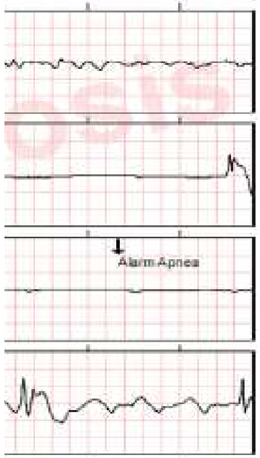
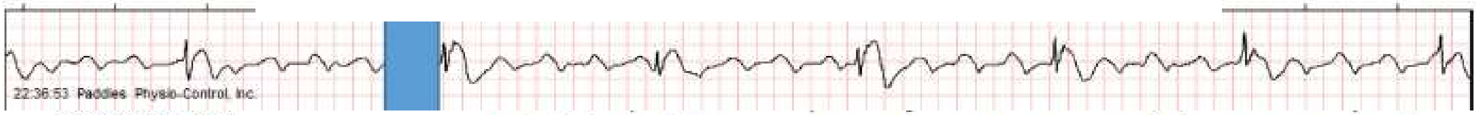




6. Conclusion

The majority of patients remain pulseless for more than 2 min following a defibrillation attempt. Moreover, the post-shock duration of asystole before return of spontaneous circulation (ROSC) is longer than 120 s in as many as 25% of patients and the interval of asystole in the patients who survive to hospital discharge can be as long as 35 s. In summary, the findings of this comprehensive study support the recommendation to immediately resume chest compressions following attempted defibrillation and to continue CPR for two more minutes before assessing for spontaneous pulses or the cardiac rhythm.





Defibrillation
Return of spontaneous circul

→ 1-Schock-Strategie

ts, there were 182 result-
ibrillation was 69 ± 136 s
n was 64 ± 157 s (median

ess for over 2 min and the
ck gap in as many as 25%.
ssions for 2 min following

ALS – Defibrillation, Modifikation der Schockstrategie

- ***wenn beobachtet*** im ***Herzkatheterlabor***, auf ***kardiologischer Station***, einer ***ITS*** oder nach ***Kardiochirurgie***
- erwägen bei beobachteten pVT / VF am bereits angeschlossenen Defibrillator:
  - *Bestätigung des Kreislaufstillstands*
  - *drei rasch aufeinander folgende Defibrillationen*
  - *nach jedem Schock zügige Kontrolle (Rhythmus?, ROSC?)*
  - *nach 3. erfolglosen Schock Standard-CPR*

ALS – „Drugs“

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- wirklicher Stellenwert ?, im Vergleich zu Thoraxkompressionen und Elektrotherapie ***zweitrangig***
- ***kritische Bewertung*** der NW von ***Adrenalin***
- grundlegende Empfehlungen nicht geändert

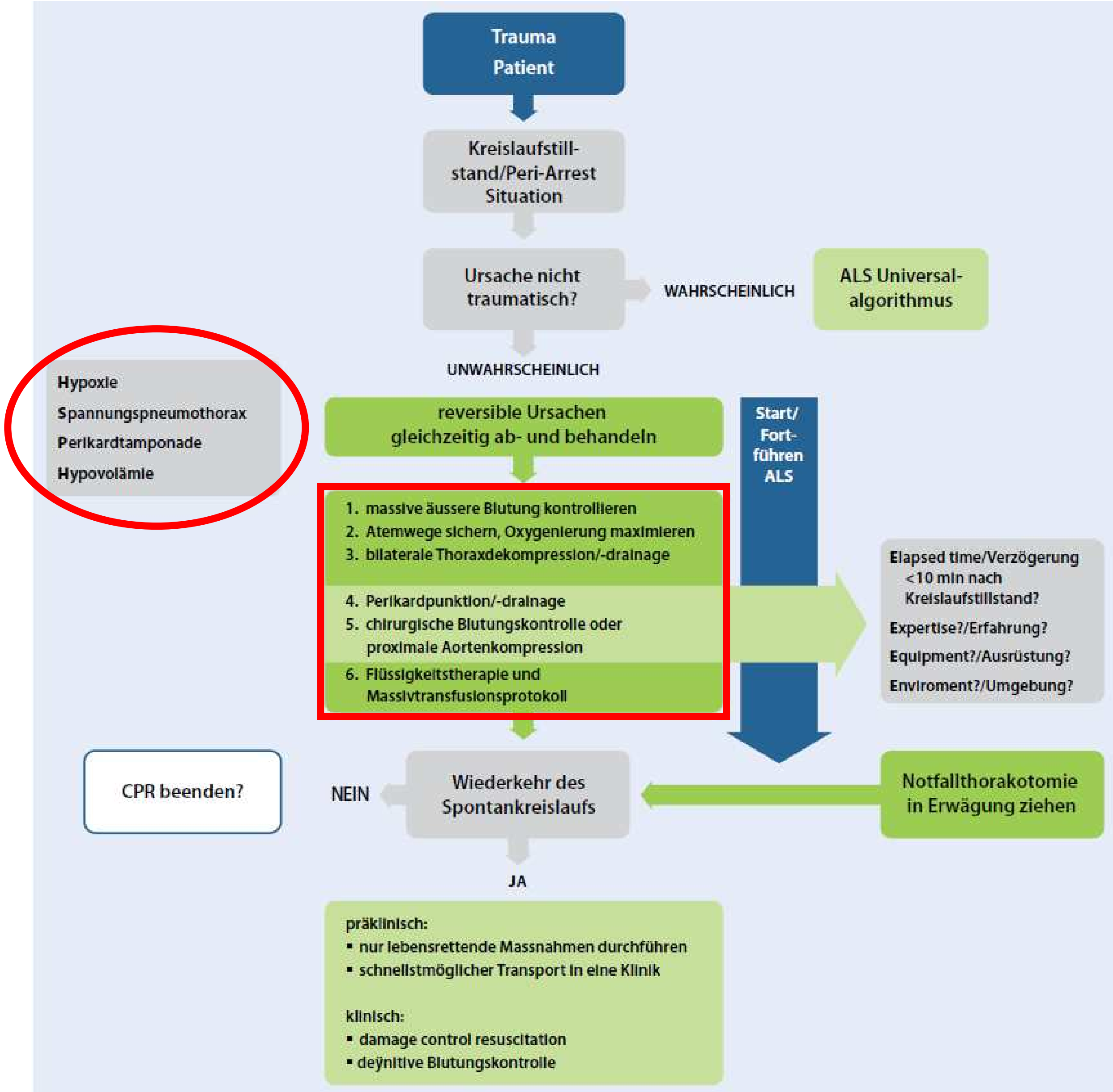
- ***Adrenalin*** 1 mg (alle 3 – 5 min)
  - bei Asystolie / PEA sofort
  - Bei pVT / VF nach dem 3. Schock
  - bei Hinweis auf ROSC bis zur nächsten KL-Kontrolle aussetzen

- ***Amiodaron*** 300 mg bei pVT / VF
  - erwäge weitere 150 mg nach dem 5. Schock

Spezielle Ursachen

4 Hs	HITS
Hypoxie	**H**erzbeuteltamponade
Hypovolämie	**I**ntoxikation
Hypo- / **H**yperkaliämie / andere Elektrolystörungen	**T**hrombose (AMI, LAE)
Hypo- / (**H**yper)thermie	**S**pannungspneumothorax

Spezielle Ursachen – Traumatisch bedingter Kreislauf-stillstand



ERC 2015

Patienten mit Herzunterstützungssystemen

- Bestätigung ggf. erschwert
- VF / pVT: Defibrillation, Asystolie: Pacing
- PEA: Schrittmacher ausschalten, VF ausschließen
- CPR: wenn ergriffene Maßnahmen fehlschlagen
- Adrenalin vorsichtig titrieren
- Therapieoptionen: Re-Sternotomie oder ECMO
- VF oder Asystolie bei wachem Patient möglich → keine HDM

adipöse Patienten

- keine Änderungen des Standardvorgehens, häufige

Schwangere

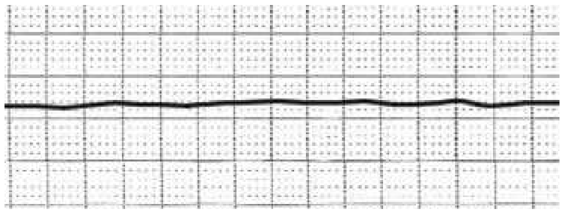
- typ. Ursachen: Blutungen, Embolien, Hypertonie, Aborte, Sepsis
- BLS: frühzeitig ***Experten*** informieren, 15 – 30 ° ***Linksseitenlage***, ***manuelle Verdrängung Uterus*** nach links, im 3. Trimester höherer ***Druckpunkt***, Not-Sectio vorbereiten
- ALS: frühe ***ETI*** sinnvoll, ***4 Hs*** und ***HITS***, Sonographie in Betracht ziehen, ***Not-Sectio*** bei Gestationsalter > 20 SSW (im Idealfall < 5 min)

Ältere

- kardiale Ursachen zunehmend, Inzidenz von **PEA** als Initialrhythmus steigt, Rückgang von pVT /VF
- kritische und frühzeitige Entscheidungsfindung
- keine Änderungen des Standardvorgehens
- Gefahr von Sternum- und Rippenfrakturen erhöht

Abbruch durch professionelle Helfer erwägen, wenn:

- Sicherheit des Helfers nicht länger gewährleistet
- offensichtlich tödliche Verletzung oder Zeichen des irreversiblen Tods
- gültige und zutreffende Patientenverfügung vorliegt
- aussichtslos / entgegen mutmaßlichen Willen
- trotz laufender ALS-Maßnahmen und ohne reversible Ursachen ***Asystolie > 20 min***



ERC 2015

Regeln zur Beendigung der Reanimation

- bei fehlenden Abbruchkriterien erwäge ***Transport unter laufender CPR*** bei:
  - vom Rettungsdienst beobachtetem Stillstand
  - ROSC zu irgendeinem Zeitpunkt
  - VT oder VF als vorliegender Rhythmus
  - mutmaßlich reversible Ursache (z.B. Hypothermie o. LAE)
- frühzeitige Entscheidung, nach 10 min ohne ROSC, Berücksichtigung der Begleitumstände

Lebensrettende Maßnahmen bei Kindern (PLS)

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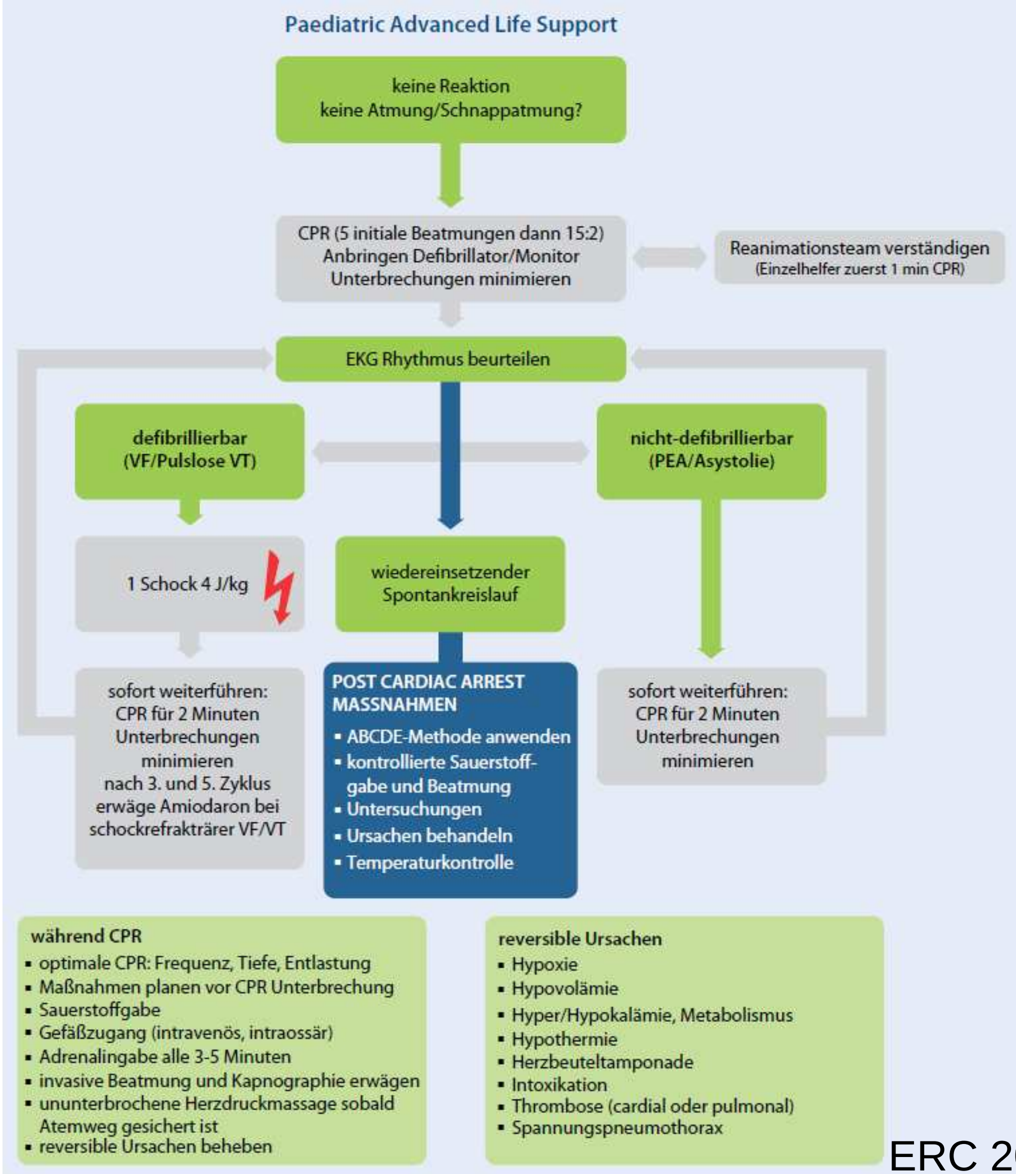
- Häufigste Ursache Asphyxie / Hypoxie durch respiratorische oder zirkulatorische Störung
- Beurteilung nach dem ABCDE-Schema
- Apnoe / Schnappatmung? – ggf. Puls tasten
- Dauer Atemhub 1 s
- Thoraxkompressionen mindestens ein Drittel Thoraxdurchmesser
- Adrenalin: 10 µg / kg KG i.v. / i.o.
- Defibrillation: 4 J / kg

Lebensrettende Maßnahmen bei Kindern (PLS)



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Postreanimationsbehandlung am Ereignisort

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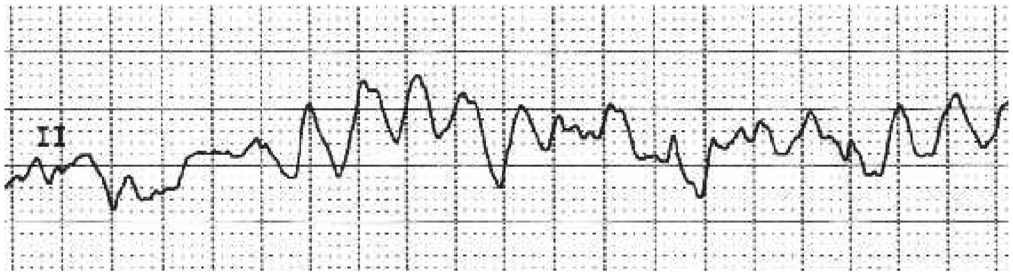
- nach ROSC ABCDE-Schema anwenden
- Ziel-SpO_2 94 – 98 %, Normokapnie, Normovolämie
- 12-Kanal-EKG
- Ursachenbehandlung
- Transfer in ***geeignetes*** KH (cardiac arrest center)
- starke Betonung einer ***vordringlichen PCI bei vermuteter kardialer Ursache***



Zusammenfassung

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- keine grundlegenden Veränderungen, aber Konkretisierungen und Präzisierungen
- Fokus auf ***BLS / T-CPR / Ersthelfer / Qualität***
- differenzierte und kritische Bewertung der medikamentösen Reanimation
- Stellenwert der Postreanimationsversorgung gestärkt
    - vordringliche PCI bei vermuteter kardialer Diagnose
- umfassende Umsetzung kann ~ ***100.000 Menschen*** jährlich in Europa das Leben retten

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Vielen Dank für Ihre Aufmerksamkeit!